Day 1 Configurations

Create a Layer 2 Network

Step 1 In NDFC, navigate to **LAN** > **Fabrics**, if you are not there already.

A page showing all of the configured fabrics appears.

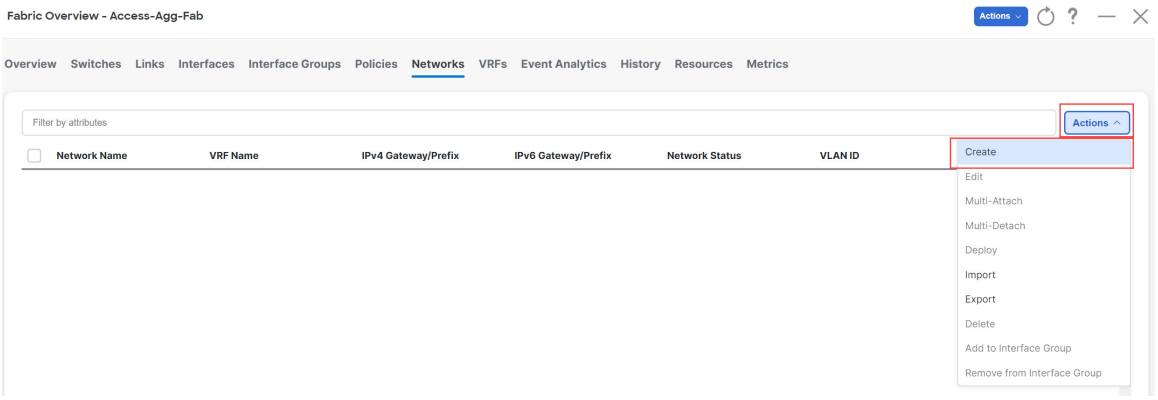
Step 2 Double-click the Enhanced Classic LAN fabric that you created using the procedures provided in Configure the Enhanced Classic LAN Fabric.

The **Fabric Overview** page for that fabric appears.

Step 3 Click the **Networks** tab.

Step 4 Create the Layer 2 network.

a) In the **Networks** tab, click **Actions** > **Create**.

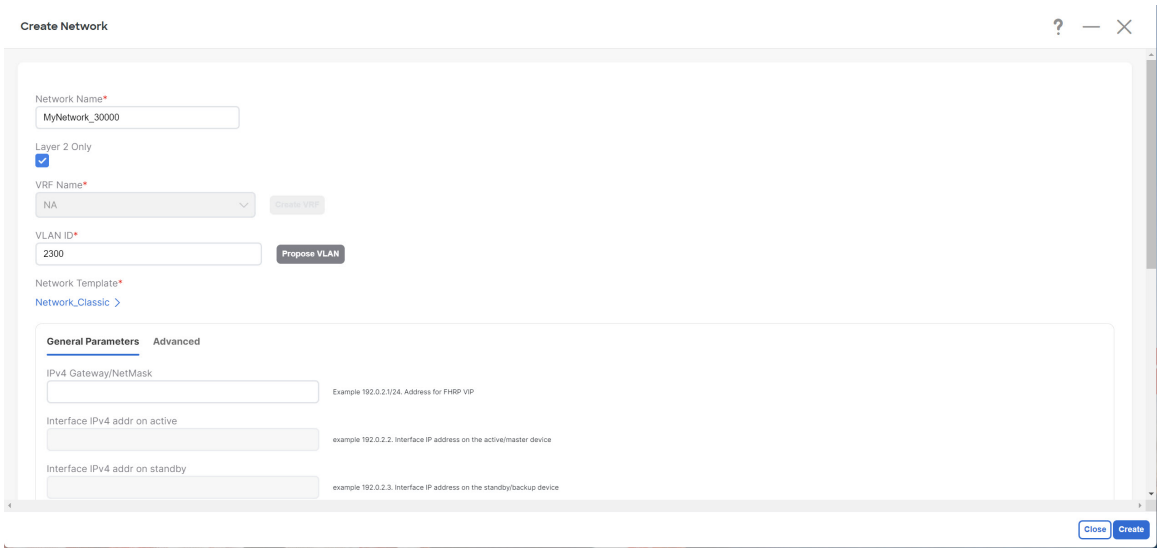


The **Create Network** window appears.

b) In the **Create Network** screen, enter the necessary information.

- A default name for the Layer 2 network is automatically generated in the **Network Name** field, but you can change it, if necessary.
- In the **Layer 2 Only** field, check the box to enable this option. This specifies that this network is Layer 2 only.
- In the **VLAN ID** field, enter a value to use for the associated VLAN, or click **Propose VLAN** to have NDFC propose a VLAN ID for your Layer 2 network, based on the available resources (the range is customizable in **Fabric Settings**).
- In the **Network Template** field, leave the default `Network_Classic` option selected.

  This is the correct template to use for the Layer 2 network.
- The gateway for a Layer 2 network resides outside of the fabric; therefore, the IP addresses in the **General Parameters** page are left empty.



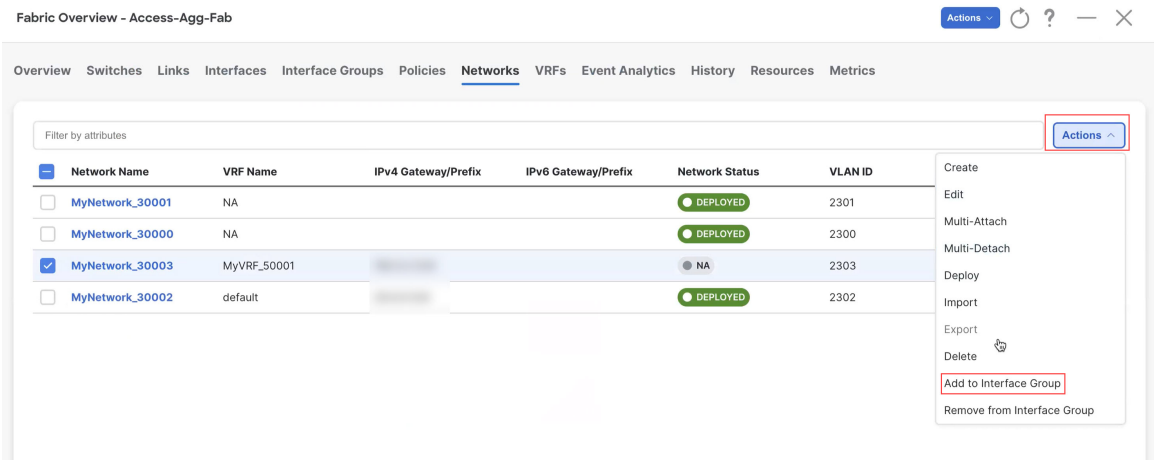
c) Fill in the remaining fields as necessary for your Layer 2 network, if necessary.
d) Click **Create**.

   You are returned to the **Networks** tab for the Enhanced Classic LAN fabric.

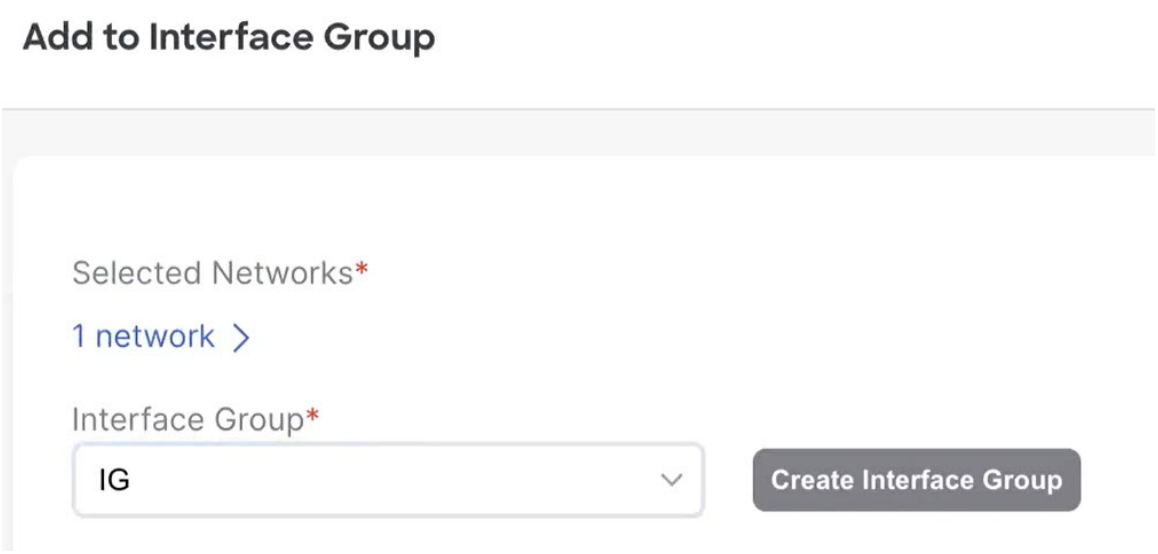
Step 5 Add the network to an interface group, if necessary.

Interface groups are useful if you are trying to deploy a network to a group of interfaces.

a) In the **Networks** tab for the Enhanced Classic LAN fabric, click on the Layer 2 network that you just created, then click **Actions** > **Add to Interface Group**.



b) Select the interface group that you want to add, or click **Create Interface Group** to create a new interface group to add.



For more detailed procedures on adding a network to an interface group, see Interface Groups in the *Cisco NDFC-Fabric Controller Configuration Guide* .

Step 6 Attach the network.

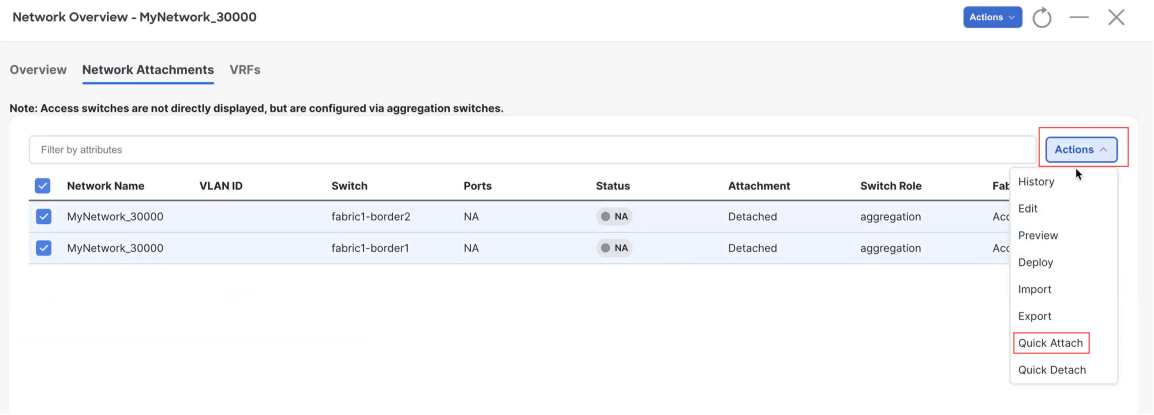
Once you've created the Layer 2 network, you can attach it to host-facing ports on the Access switch, which will then allow the VLAN on these trunk or access ports and also on the vPC/port channel/standalone ports between the Access and Aggregation switches.

Determine if you want to perform a **quick attach** or a **multi-attach**.

- If you want to perform a **quick attach**, where you will attach this network to the selected switches, follow these steps:

a) In the **Networks** tab for the Enhanced Classic LAN fabric, double-click on the Layer 2 network that you just created.
b) Click the **Network Attachments** tab.

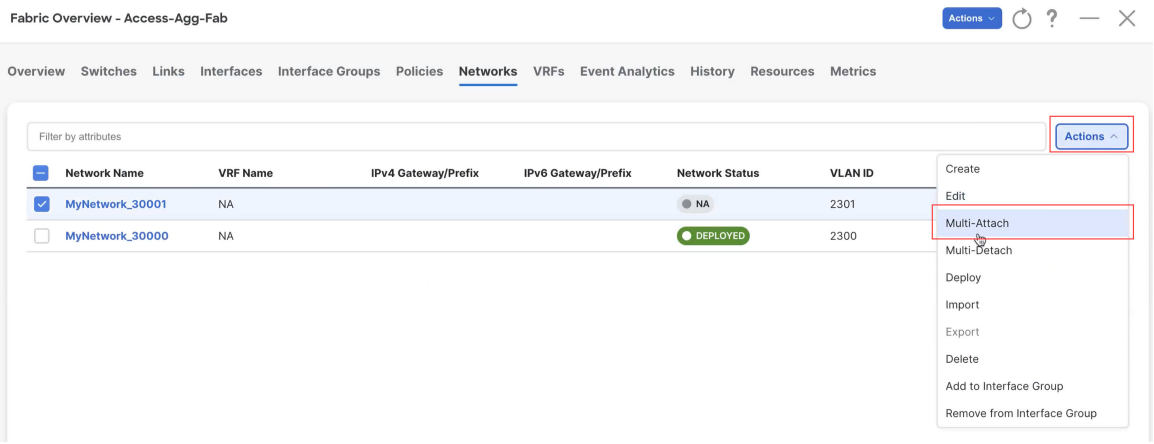
c) Locate the switches with **aggregation** shown in the **Switch Role** column and click the boxes next to those switches.



d) Click **Actions** > **Quick Attach**, then go to Step 7, on page 5.

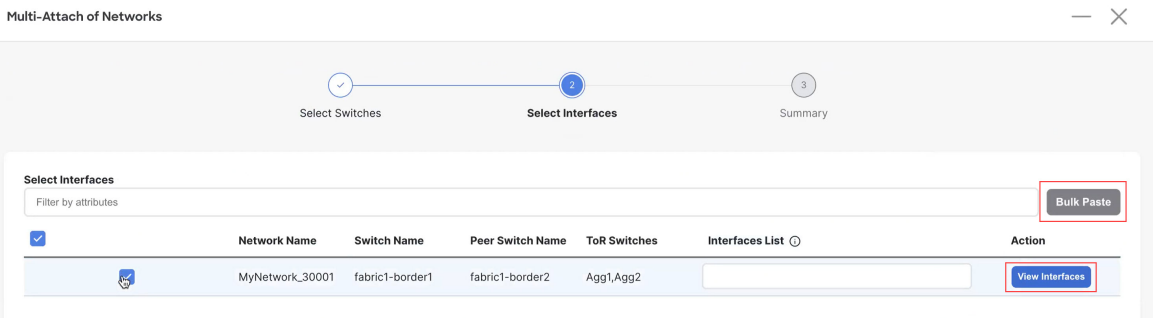
- If you want to perform a **multi-attach**:

a) In the **Networks** tab for the Enhanced Classic LAN fabric, click on the Layer 2 network that you just created, then click **Actions** > **Multi-Attach**.



b) Click the box next to each switch that you want to attach to the network, then click **Next**.

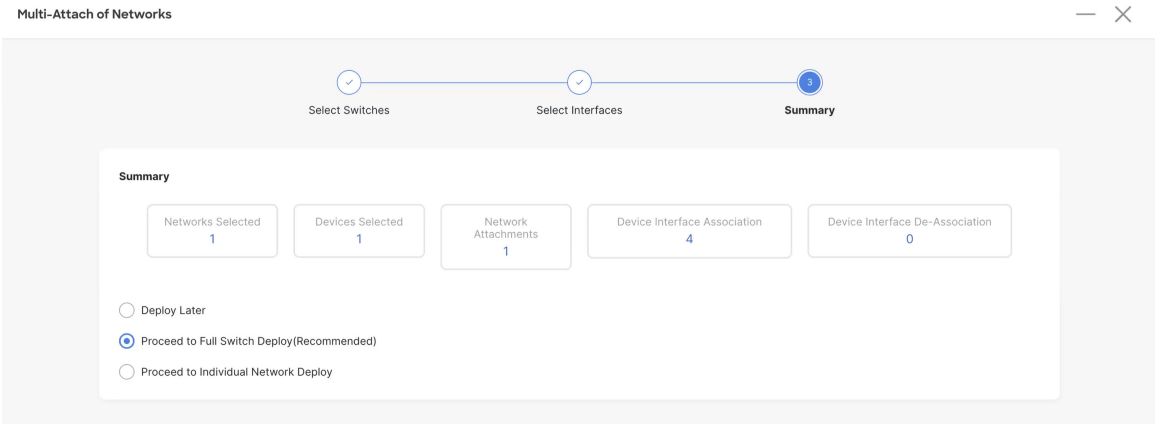
c) Click the box next to each interface that you want to select, then select the interfaces using either **Bulk Paste** or **View Interfaces**.



- If you select **Bulk Paste**, enter the interfaces to be pasted in the **Interfaces List** area, then click **Save**.

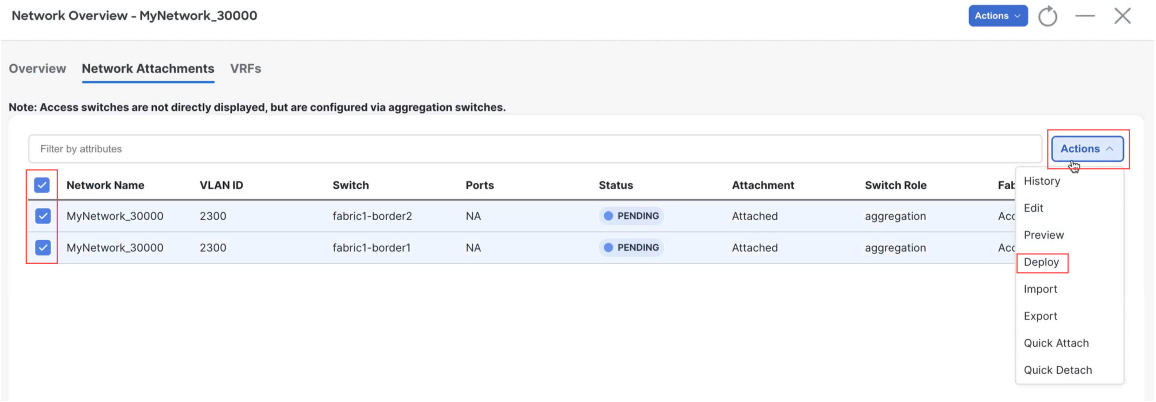
- If you select **View Interfaces**, click the boxes next to the specific ports that you want to attach in the following screen, then click **Save**.

d) In the Select Interfaces window, click **Next**.
e) Make the necessary deployment selection in the next window, then click **Save**.

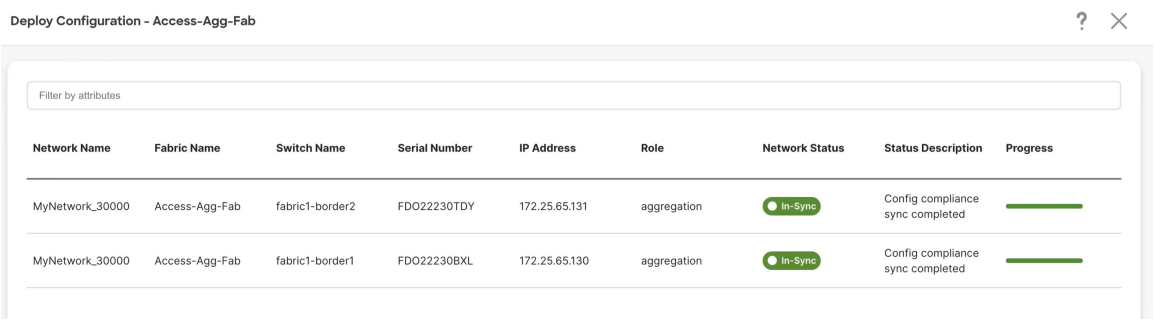


Step 7 Deploy the network.

In the **Network Attachments** window, select the networks that you just attached, then click **Actions** > **Deploy**.



Step 8 When the recalculation process is completed, click **Deploy** and verify that the status shown in the **Config Status** column shows as **In-Sync**.



What to do next

Create a Layer 3 network using the procedures provided in Create a Layer 3 Network, on page 6.

Create a Layer 3 Network

A Layer 3 network can be in either a default or a custom VRF.

Before you begin

Step 1 Navigate to the **Networks** tab for the Enhanced Classic LAN fabric, if you are not there already.

a) In NDFC, navigate to **LAN** > **Fabrics**.

A page showing all of the configured fabrics appears.

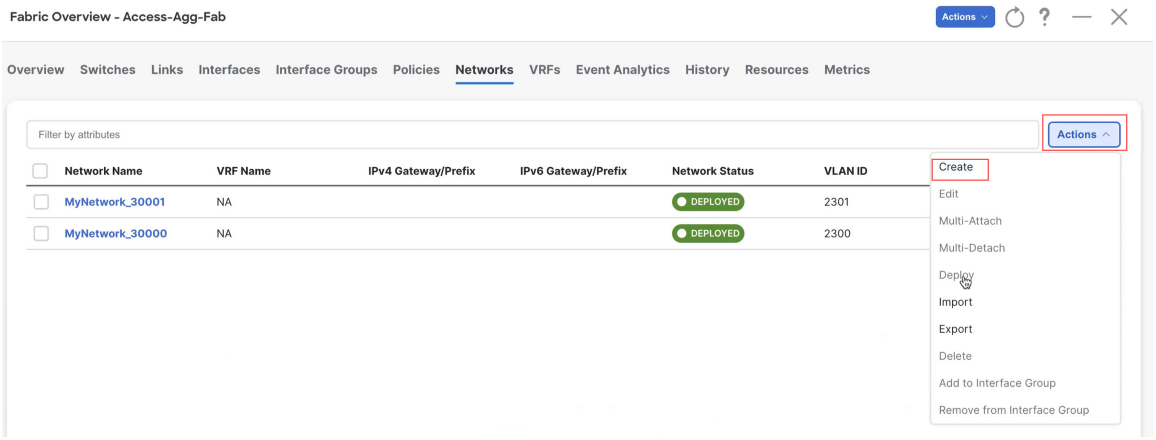
b) Double-click the Enhanced Classic LAN fabric that you created using the procedures provided in Configure the Enhanced Classic LAN Fabric.

The **Fabric Overview** page for that fabric appears.

c) Click the **Networks** tab.

Step 2 Create the Layer 3 network.

a) In the **Networks** tab, click **Actions** > **Create**.



The **Create Network** window appears.

b) In the **Create Network** screen, click the **General Parameters** tab and enter the necessary information.

- Change the name for the Layer 3 network in the **Network Name** field, if necessary.

  The entry in the **Network Name** field is auto-populated but can be changed, if necessary.

- In the **Layer 2 Only** field, verify that there is no check in the box so that this option is not enabled.

  You do not want the **Layer 2 Only** option enabled for a Layer 3 network.

c) Determine if you want to use the default VRF or if you want to create a VRF for this Layer 3 network.

- If you want to use the default VRF for this Layer 3 network, in the **VRF Name** field, choose `default` from the list of VRFs available. Go to 2.d, on page 8.
- Follow these steps if you want to create a custom VRF for this Layer 3 network:

  1. In the **VRF Name** field, click **Create VRF**.

     The **Create VRF** page appears.

     Change the name for the custom VRF for the Layer 3 network in the **VRF Name** field, if necessary. The entry in the **VRF Name** field is auto-populated but can be changed, if necessary.

  2. Click the **General Parameters** tab and enter the necessary information.

     (Optional) Enable the **Enable Auto Peering over SVI Between VPC Aggregations** option if desired, which enables per VRF iBGP or OSPF peering between Aggregation switches. Note that the protocol used is based on the VRF-Lite routing protocol configured in the Fabric setting.

  3. Click the **Advanced** tab and enter the necessary information.

     The settings in the **Advanced** area include options for BGP authentication, route maps, and static 0/0 configurations, where you could configure a default (0/0) route towards the core switch.

  4. Click **Save** to save the custom VRF for the Layer 3 network.

     You are returned to the **Create Network** page.

     Once this Layer 3 network is attached in the next step, if the **Enable Auto Peering over SVI Between VPC Aggregations** option is enabled, NDFC will create the configuration for an iBGP peering session or an

OSPF neighborship between the Aggregation switches for this new VRF, including the VLAN ID and the IP address for the SVI.

d) In the **Create Network** screen, enter the necessary information in the remaining fields in the **General Parameters** tab.

- In the **VLAN ID** field, enter a value to use for the associated VLAN, or click **Propose VLAN** to have NDFC propose a VLAN ID for your Layer 3 network, based on the available resources (the range is customizable in **Fabric Settings**).
- Define the gateway IP address in either the **IPv4 Gateway/Netmask** or the **IPv6 Gateway/Netmask** fields.

  You must define the IPv4 or IPv6 gateway IP address for the Layer 3 network. For these procedures, the gateway is the Aggregation switch within the fabric.

  Note For the next two fields in the **General Parameters** tab, note that you will be defining the active and standby devices in a later step in these procedures.

- Define the interface address on the active/master device in either the **Interface IPv4 addr on active** or the **Interface IPv6 addr on active** fields.
- Define the interface address on the standby/backup device in either the **Interface IPv4 addr on standby** or the **Interface IPv6 addr on standby** fields.

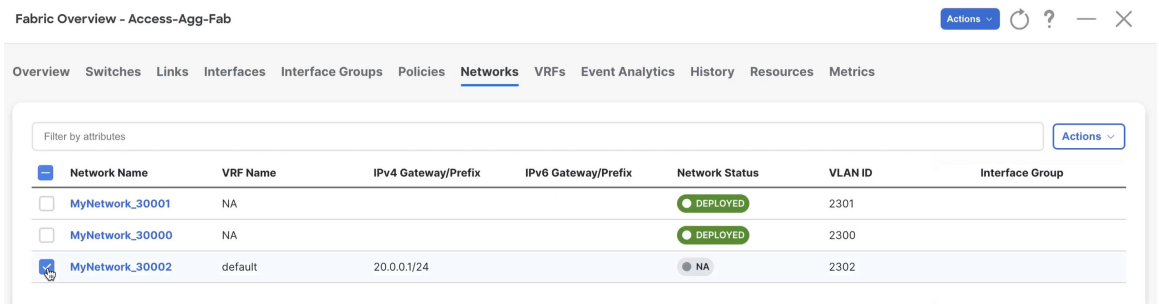
e) In the **Create Network** screen, click the **Advanced** tab and enter the necessary information.

Customize the First Hop Redundancy Protocol settings (either HSRP or VRRP, based on the fabric settings) in this page. You can determine which of the Aggregation switches will be used for the active and standby First Hop Redundancy Protocol when you attach the network.

f) Fill in the remaining fields as necessary for your Layer 3 network.

g) Click **Create**.

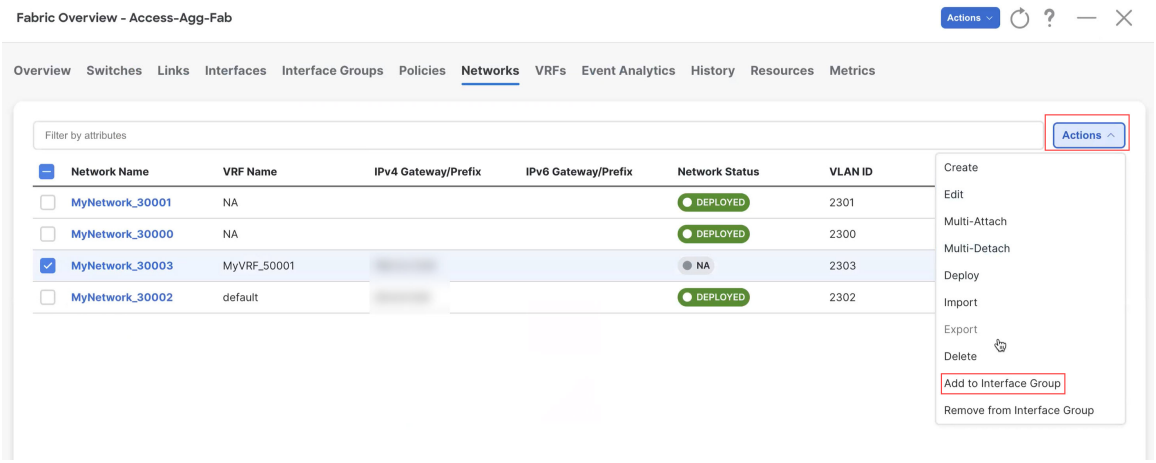
The **Networks** page displays the newly created Layer 3 network and accompanying VRF.



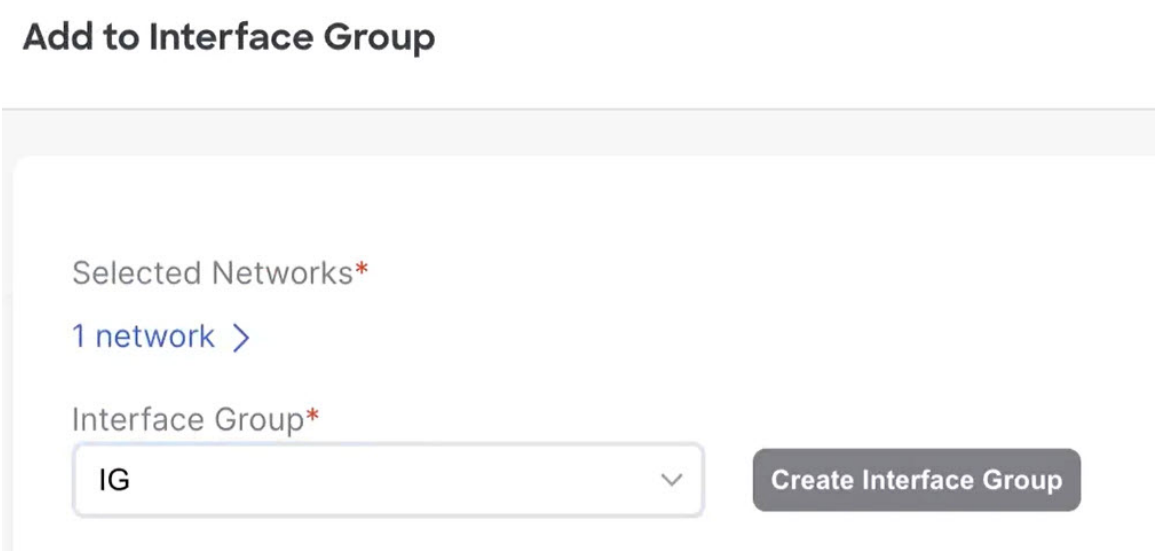
Step 3 Add the network to an interface group, if necessary.

Interface groups are useful if you are trying to deploy a network to a group of interfaces.

a) In the **Networks** tab for the Enhanced Classic LAN fabric, click on the Layer 3 network that you just created, then click **Actions** > **Add to Interface Group**.



b) Select the interface group that you want to add, or click **Create Interface Group** to create a new interface group to add.



For more detailed procedures on adding a network to an interface group, see Interface Groups in the *Cisco NDFC-Fabric Controller Configuration Guide* .

Step 4 Attach the network.

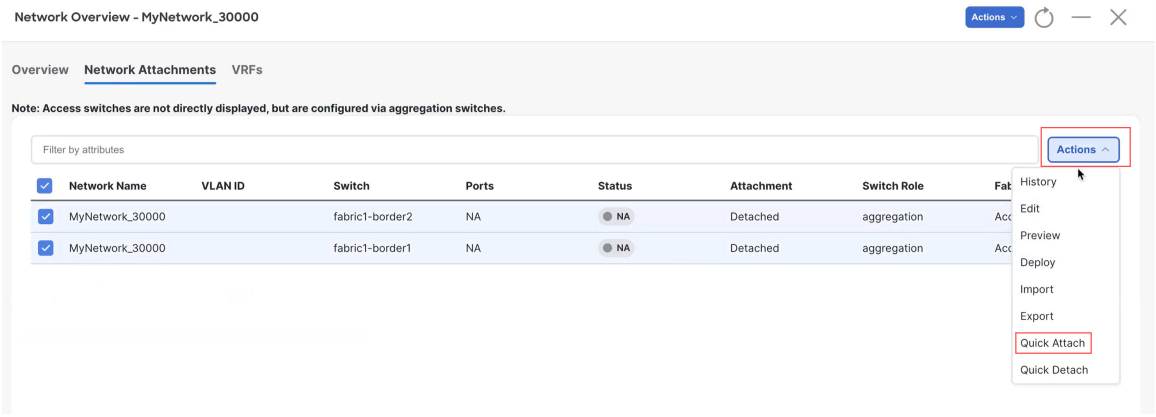
Once you've created the Layer 3 network, you can attach it to host-facing ports on the Access switch, which will then allow the VLAN on these trunk or access ports and also on the vPC/port channel/standalone ports between the Access and Aggregation switches.

Determine if you want to perform a **quick attach** or a **multi-attach**.

- If you want to perform a **quick attach**, where you will attach this network to the selected switches, follow these steps:

a) In the **Networks** tab for the Enhanced Classic LAN fabric, double-click on the Layer 3 network that you just created.
b) Click the **Network Attachments** tab.

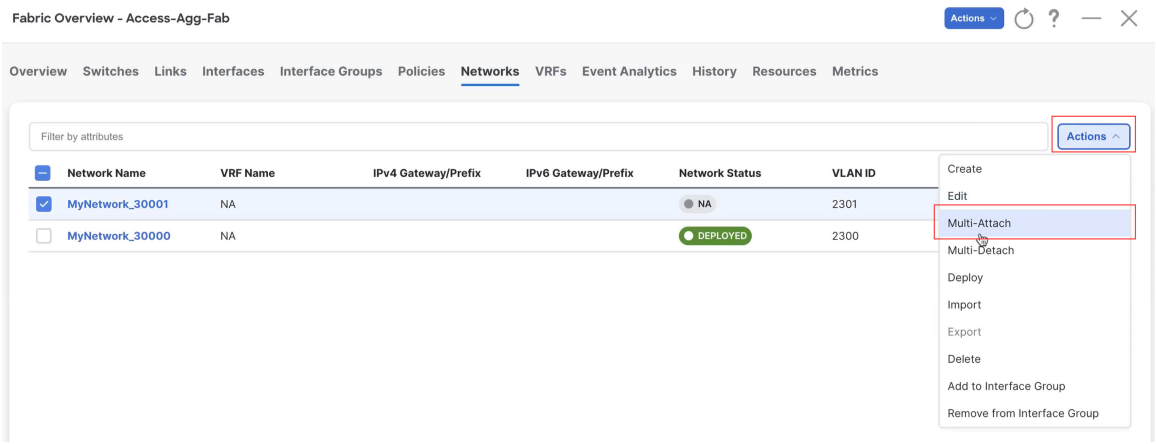
c) Locate the switches with **aggregation** shown in the **Switch Role** column and click the boxes next to those switches.



d) Click **Actions** > **Quick Attach**, then go to Step 5, on page 11.

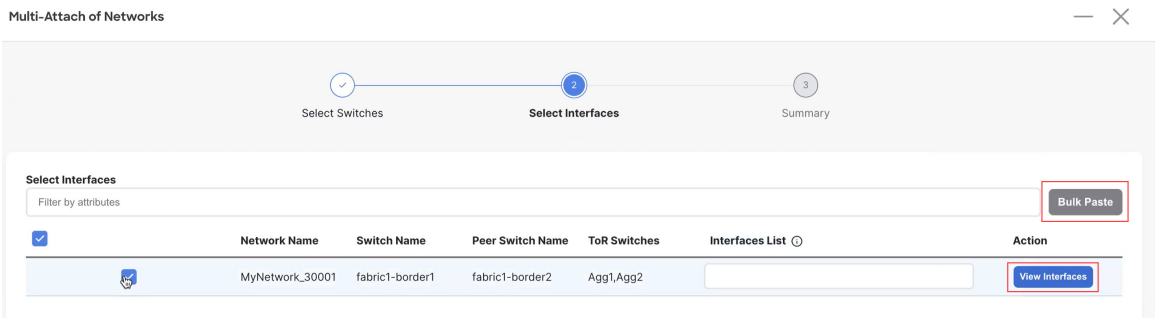
- If you want to perform a **multi-attach**:

a) In the **Networks** tab for the Enhanced Classic LAN fabric, click on the Layer 3 network that you just created, then click **Actions** > **Multi-Attach**.



b) Click the box next to each switch that you want to attach to the network, then click **Next**.

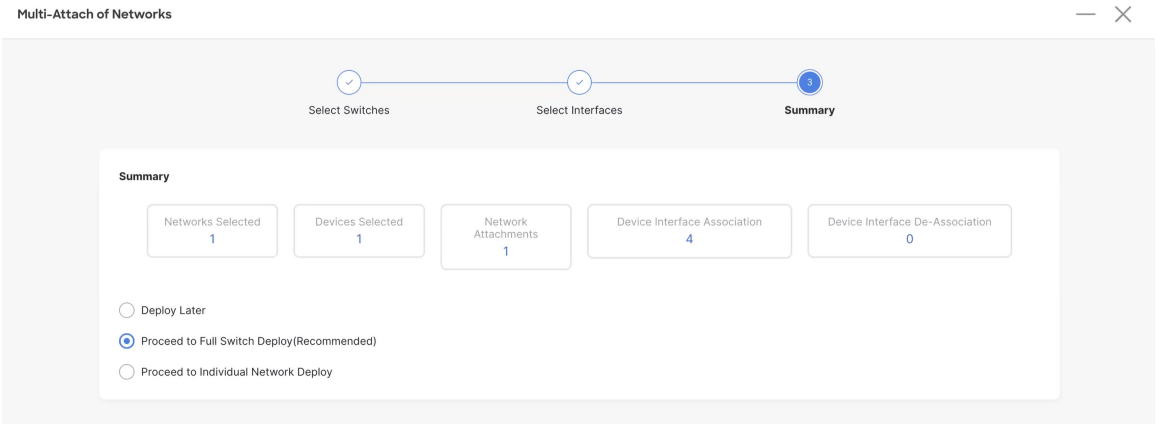
c) Click the box next to each interface that you want to select, then select the interfaces using either **Bulk Paste** or **View Interfaces**.



- If you select **Bulk Paste**, enter the interfaces to be pasted in the **Interfaces List** area, then click **Save**.

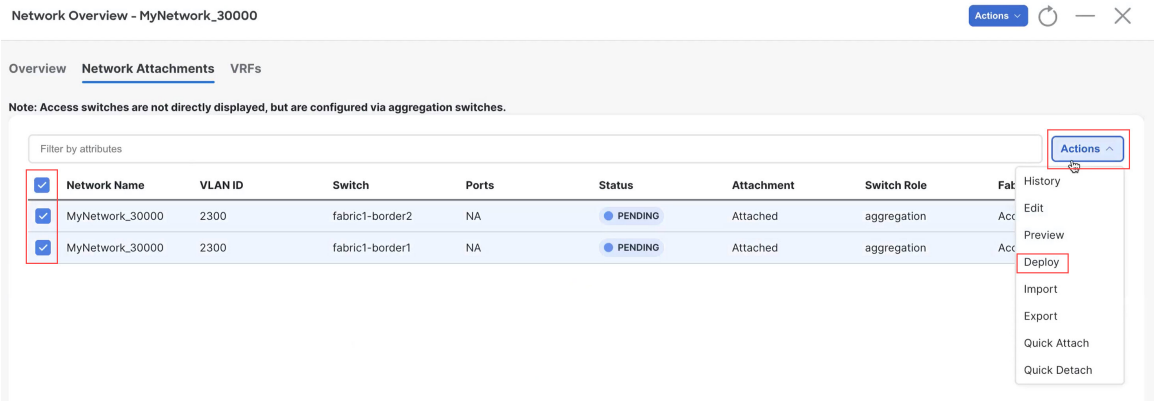
- If you select **View Interfaces**, click the boxes next to the specific ports that you want to attach in the following screen, then click **Save**.

d) In the Select Interfaces window, click **Next**.
e) Make the necessary deployment selection in the next window, then click **Save**.

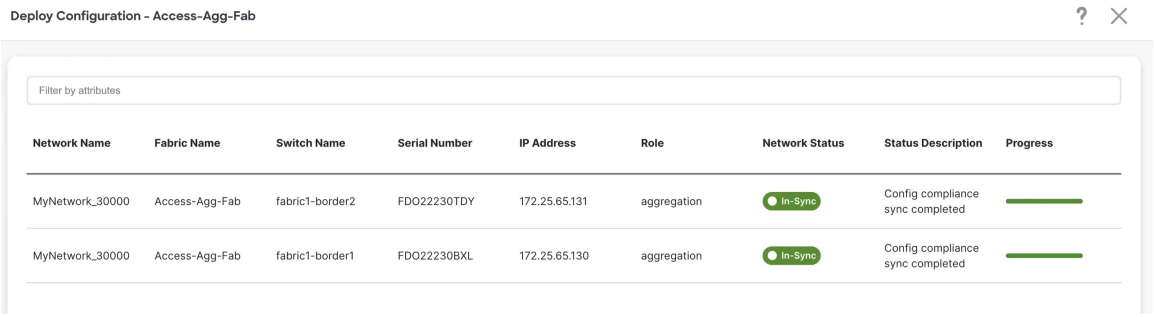


Step 5 Deploy the network.

In the **Network Attachments** window, select the networks that you just attached, then click **Actions** > **Deploy**.



Step 6 When the recalculation process is completed, click **Deploy** and verify that the status shown in the **Config Status** column shows as **In-Sync**.



What to do next

Configure the VRF Lite extension using the procedures provided in Configure the VRF Lite Extension, on page 12.

Configure the VRF Lite Extension

In these procedures, you will configure the VRF Lite extension between the Aggregation and Core switches. NDFC supports either automatic or manual configuration modes for VRF Lite between the Aggregation and Core switches. For this use case, we will configure VRF Lite using the automatic configuration.

You can go through the configurations in this section whether you have a three-tier topology or a two-tier (Collapsed Core) topology. However, in order to be able to configure the VRF Lite extension, you must have created a custom VRF for the Layer 3 network in Create a Layer 3 Network, on page 6, rather than using a default VRF.

Step 1 Verify that the necessary default configurations in the **Resources** page are set correctly for VRF Lite.

a) In NDFC, navigate to **LAN** > **Fabrics**, if you are not there already.

A page showing all of the configured fabrics appears.

b) Double-click the Enhanced Classic LAN fabric that you created using the procedures provided in Configure the Enhanced Classic LAN Fabric.

The **Fabric Overview** page for that fabric appears.

c) Click **Actions** > **Edit Fabric**.

The **Edit Fabric** page appears.

d) Click the **Resources** tab.

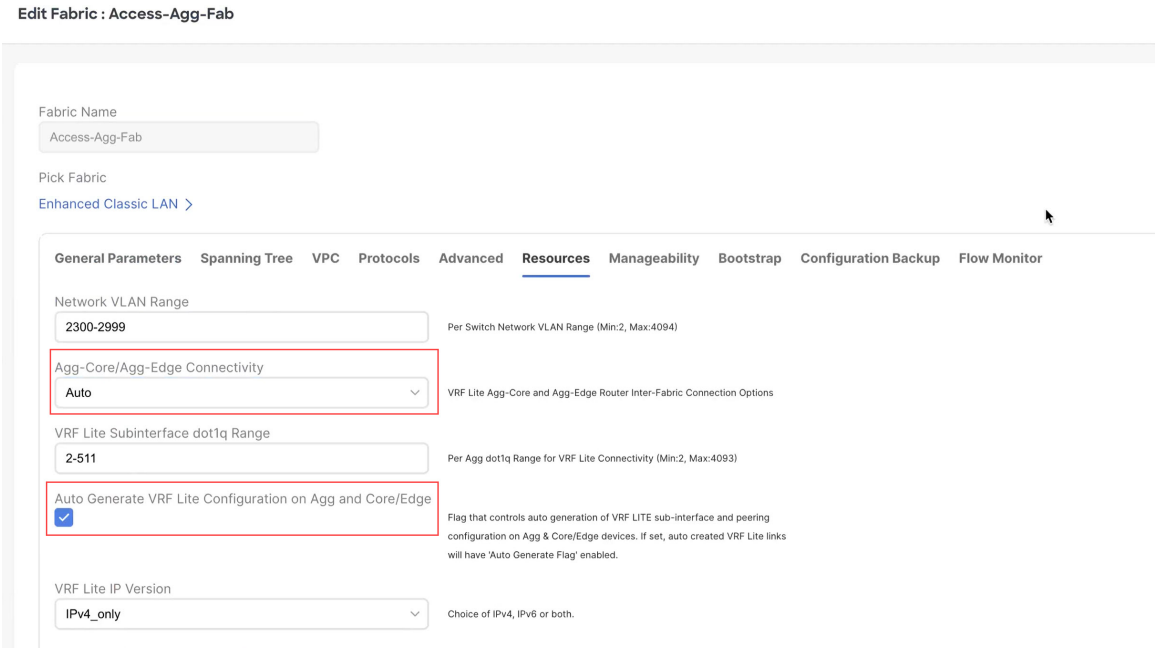
e) Verify that the necessary default configurations in the **Resources** page are set correctly for VRF Lite.

- In the **Agg-Core/Agg-Edge Connectivity** field, verify that the **Auto** option is set.

  The Aggregation-Core peering protocol that will be used is based on the setting that you entered in the **Routing Protocol** field in Configure the Enhanced Classic LAN Fabric.

- Check the box in the **Auto Generate VRF Lite Configuration on Agg and Core/Edge** field to enable this option.

- If the **Routing Protocol** field is set to **ebgp** and you are using the Cisco Nexus 7000 or 9000 Series switches, or the Cisco Catalyst 9000 series switches for the Core layer, enabling the **Auto Generate VRF Lite Configuration on Agg and Core/Edge** option automatically generates the VRF Lite configuration on the Aggregation and Core switches.
- If the **Routing Protocol** field is set to **ospf** and you are using the Cisco Nexus 7000 or 9000 Series switches for the Core layer, enabling the **Auto Generate VRF Lite Configuration on Agg and Core/Edge** option automatically generates the VRF Lite configuration on the Aggregation and Core switches.
- In other cases, such as using Cisco ASR 9000 Series Aggregation Service Routers as the Core Router or Edge Router, then the VRF Lite intent and configurations will not be automatically generated on the Core Router or Edge Router. Instead, for each VRF, you must manually create a policy using the necessary policy.



Step 2 Verify that the links between the Aggregation and Core switches have the correct templates attached and the proper settings applied.

a) Navigate back to the **Fabric Overview** page for the Enhanced Classic LAN fabric.

The **Overview** page for that fabric appears.

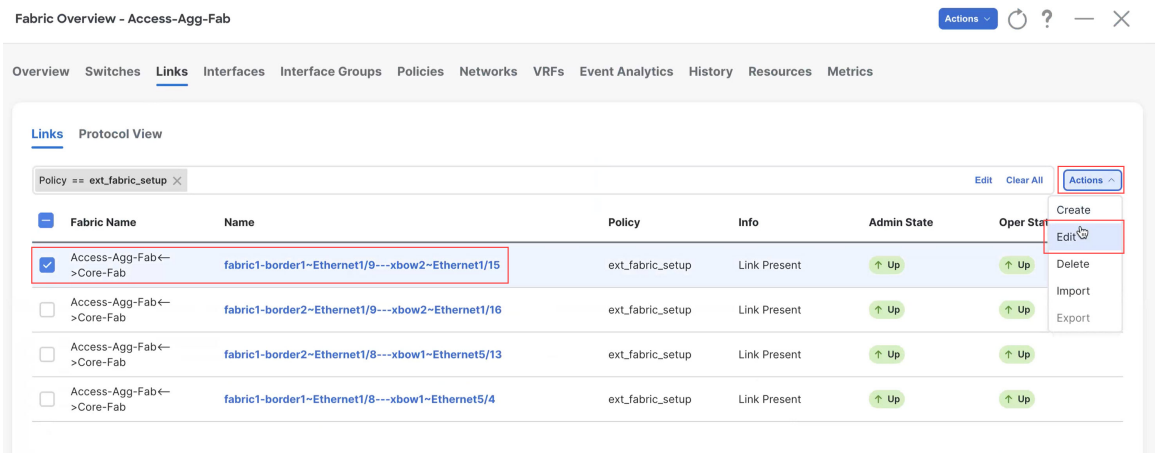
b) Click the **Links** tab.

c) Locate the links from the Aggregation switches to the Core switches in this page.

For example, you would have two Aggregation switches and one Core switch for this use case, so you would therefore locate these two links in this page:

- The link between the first Aggregation switch and the Core switch
- The link between the second Aggregation switch and the Core switch

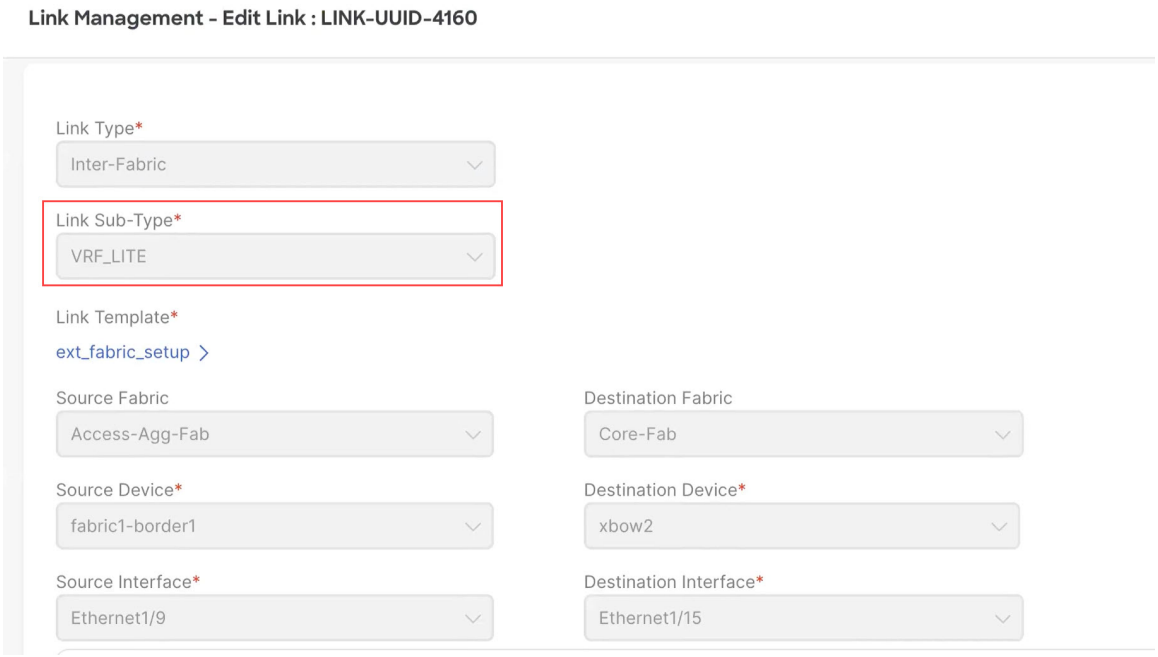
d) Click on the box next to the link between the first Aggregation switch and the Core switch, then click **Actions** > **Edit**.



The **Link Management - Edit Link** page appears for this link.

e) Verify that `VRF_LITE` is automatically selected in the **Link Sub-Type** field.

f) Verify that all of the remaining parameters are automatically populated correctly, such as the source and destination fabrics, devices, and interfaces.



g) (Optional) Repeat these steps for the remaining links from the Aggregation switches to the Core switches in this page, if you want additional verification.

For example, since we have two Aggregation switches in this use case, you would click the link between the second Aggregation switch and the Core switch in this page, then repeat these steps to verify that the links between the second Aggregation switch and the Core switch have the correct templates attached and the proper settings applied.

Step 3 In the **Fabric Overview** page for the Enhanced Classic LAN fabric, click the **VRFs** tab.

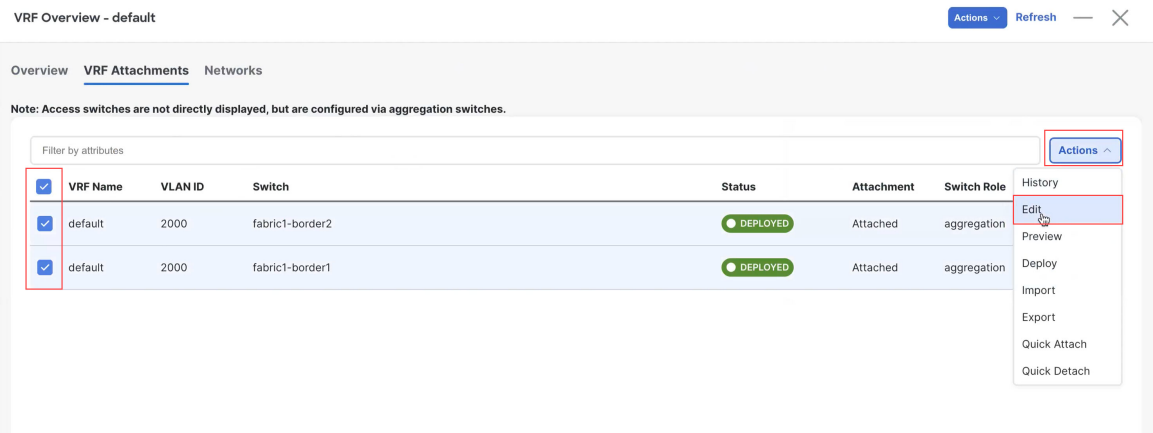
Step 4 Double-click the custom VRF that you created for the Layer 3 network.

The **VRF Overview** page appears for this VRF.

Step 5 Click the **VRF Attachments** tab.

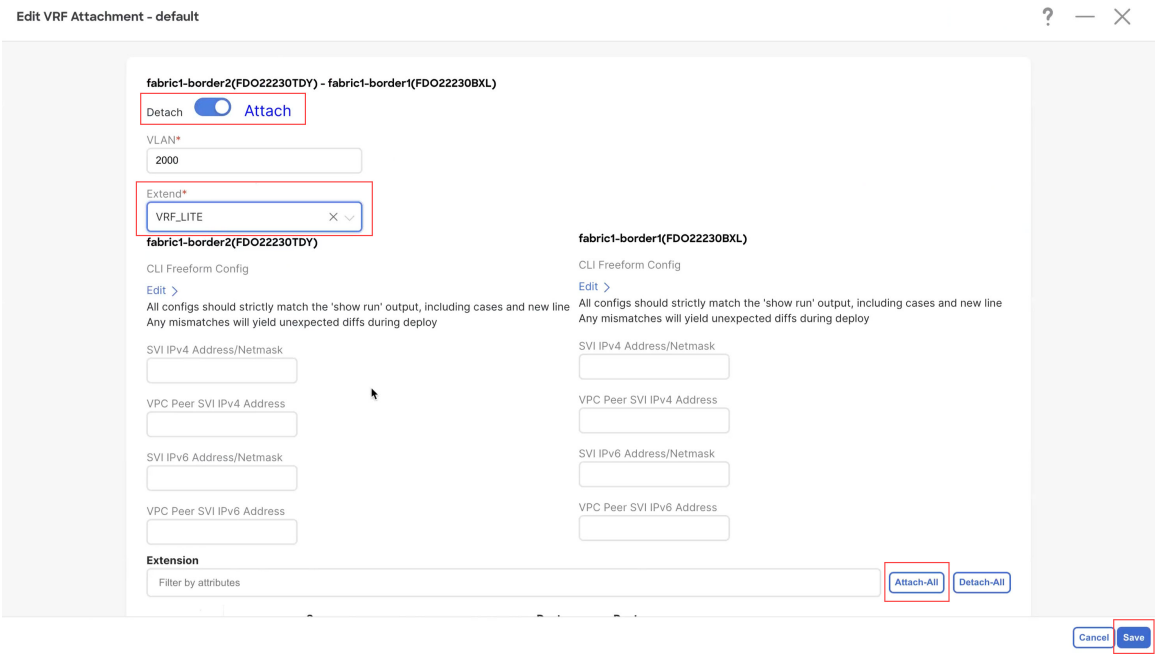
The VRF attachments for this VRF are displayed.

Step 6 Click the boxes next to the VRF attachments that you want to extend using VRF Lite and click **Actions** > **Edit**.



Step 7 In the **Edit VRF Attachment** page, make the necessary configurations to extend the VRF attachments using VRF Lite to attach the Aggregation switches to the Core switche.

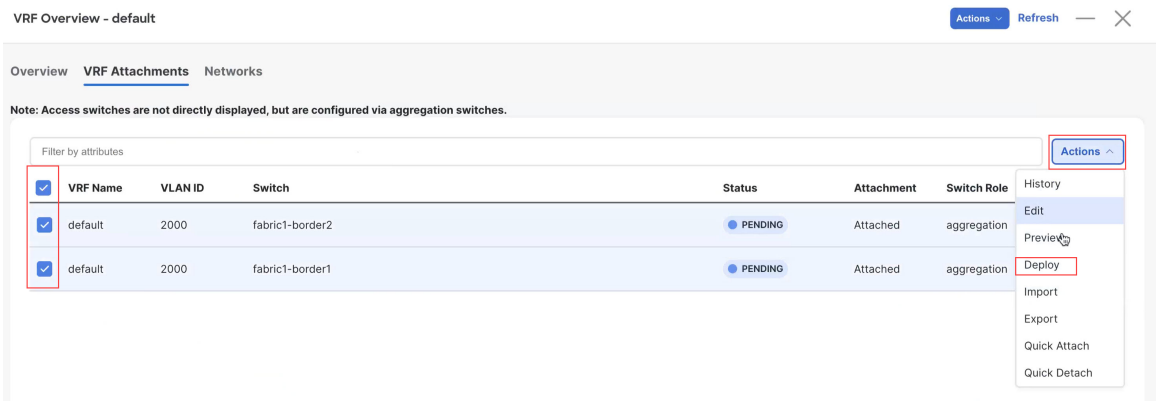
- Flip the switch to **Attach** at the top of the page.
- In the **Extend** field, choose the **VRF_LITE** option.
- Click **Attach-All**.



Click **Save** once you have completed the necessary configurations in the **Edit VRF Attachment** page. You are returned to the **VRF Attachments** page.

Step 8 Deploy the configuration using either of the two methods described below.

- In the **VRF Attachments** page, select the two VRF attachments and click **Actions** > **Deploy**.

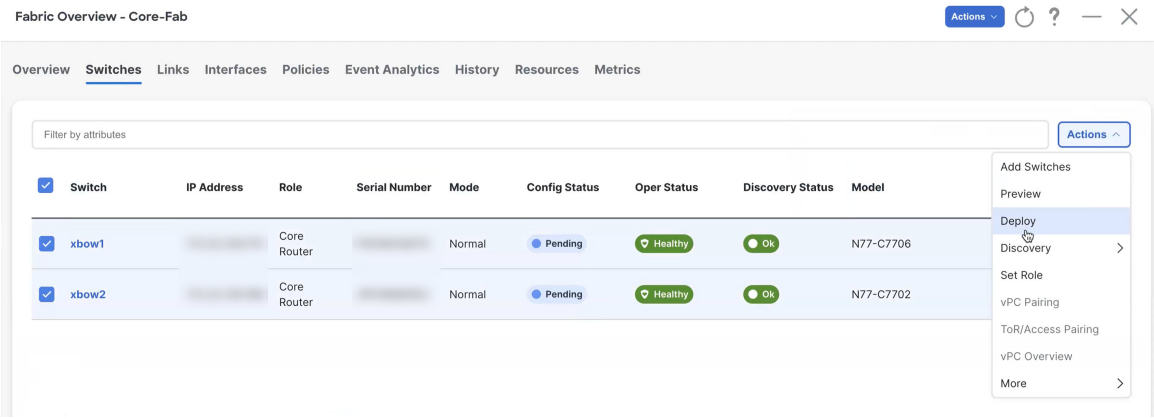


- In the **Fabric Overview** page for the Enhanced Classic LAN fabric, click the **Switches** tab and click the boxes next to the two Aggregation switches, then click **Actions** > **Deploy**.

Step 9 If you created a External Connectivity Network fabric for the core tier using the procedures in Configure the External Connectivity Network Fabric, navigate back to **LAN** > **Fabrics** and double-click on the External Connectivity Network fabric.

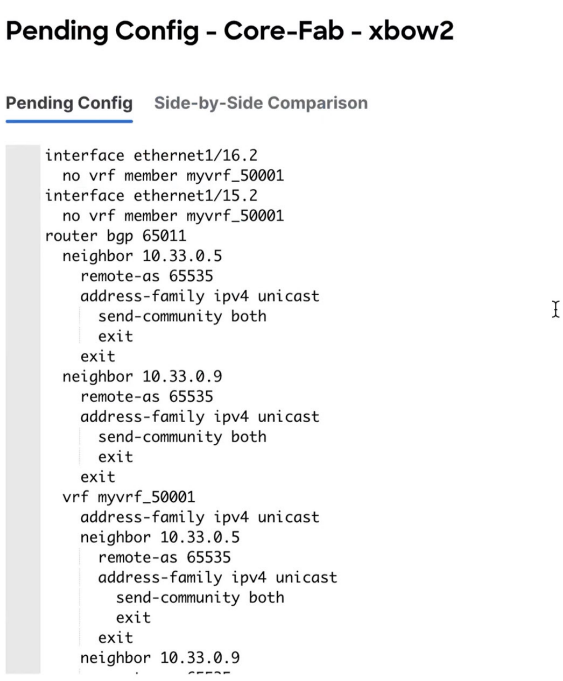
You must perform the same operations on the External Connectivity Network fabric to enable the pending configurations for VRF Lite to also be pushed to the Core switches.

Step 10 In the **Fabric Overview** page for the External Connectivity Network fabric, click the **Switches** tab and click the box next to the Core switch, then click **Actions** > **Deploy**.

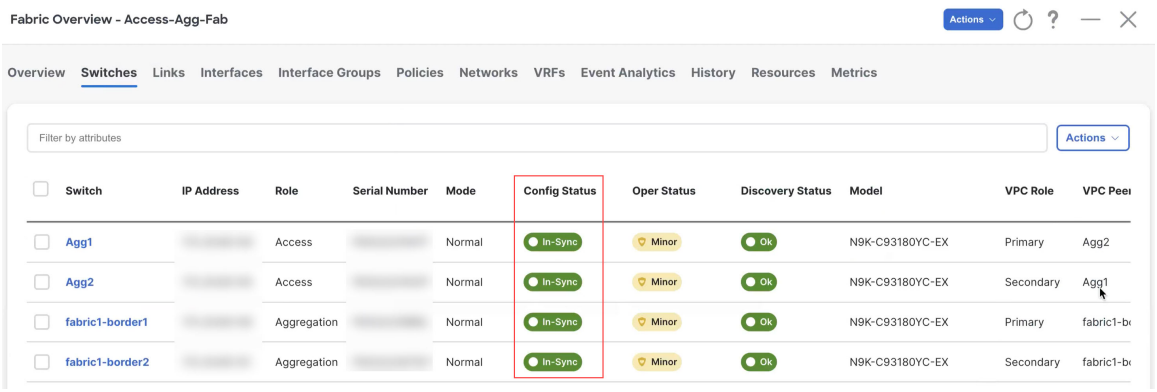


Step 11 Preview the configuration updates as the deployment process progresses.

You can click on the blue link in the **Pending Config** column to get additional information on the changes that are being configured for the Core switch.



Step 12 When the recalculation process is completed, click **Deploy All** and verify that the status shown in the **Config Status** column shows as **In-Sync**.


Fabric Overview - Access-Agg-Fab
Actions
Overview
Switches
Links
Interfaces
Interface Groups
Policies
Networks
VRFs
Event Analytics
History
Resources
Metrics
Filter by attributes
Actions
Switch
IP Address
Role
Serial Number
Mode
Config Status
Oper Status
Discovery Status
Model
VPC Role
VPC Peer
Agg1
Access
Normal
In-Sync
Minor
Ok
N9K-C93180YC-EX
Primary
Agg2
Agg2
Access
Normal
In-Sync
Minor
Ok
N9K-C93180YC-EX
Secondary
Agg1
fabric1-border1
Aggregation
Normal
In-Sync
Minor
Ok
N9K-C93180YC-EX
Primary
fabric1-b
fabric1-border2
Aggregation
Normal
In-Sync
Minor
Ok
N9K-C93180YC-EX
Secondary
fabric1-b